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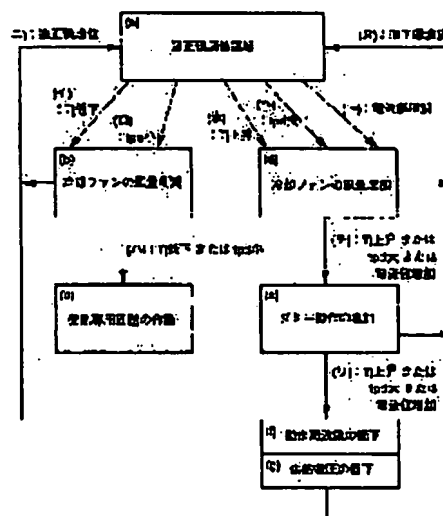
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## (54) INFORMATION PROCESSING SYSTEM CAPABLE OF CONTROLLING POWER CONSUMPTION AND COOLING SYSTEM

## (57)Abstract:

PROBLEM TO BE SOLVED: To conduct system operation with optimum power consumption by deriving maximum performance from the information processing system in proper environment.

SOLUTION: The system operating in proper environment (a) detects a decrease (h) or small tpd (i), the system operates while the cooling fan is reduced (b) in air capacity and if no improvement is obtained, a heat generating dedicated circuit is placed in operation (c) to put the system back to proper environment value (j). When a  $T_j$  rise (k), large tpd (l), or an increase (m) in supply current quantity is detected, the air capacity of the cooling fan is increased (d) and if improvement is still not obtained either (n), dummy operation (e) is interposed to make the operation of the system slow. According to circumstances (o), at least one of a decrease in operating frequency (f) and a decrease in supply voltage (g) is made and when a proper (p) is obtained, the system is placed in the operation (a) in a normal state.



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CLAIMS

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## [Claim(s)]

[Claim 1] In an information processor equipped with two or more integrated circuits, the power unit which supplies power to an integrated-circuit group, and the cooling system which cools an integrated-circuit group A chip thermometry means to measure the chip temperature  $T_j$  of an integrated circuit and to output to said information processor is established. Said information processor Information processing system which controls the power consumption and the cooling system which are characterized by adjusting said chip temperature  $T_j$  by weakening cooling power of said cooling system when the chip temperature  $T_j$  falls from a proper value, and strengthening cooling power of said cooling system when the chip temperature  $T_j$  rises from a proper value.

[Claim 2] In the information processing system which controls power consumption and a cooling system according to claim 1, an exoergic specialized circuit and a dummy actuation control circuit are prepared. Said information processor When a fall [ value / of said chip temperature  $T_j$  / proper ] cannot be adjusted, an exoergic specialized circuit is started. Information processing system which controls the power consumption and the cooling system which are characterized by adjusting said chip temperature  $T_j$  by starting said dummy actuation control circuit when a rise [ value / of said chip temperature  $T_j$  / proper ] cannot be adjusted.

[Claim 3] In the information processing system which controls power consumption and a cooling system according to claim 1 or 2, a clock speed control circuit and an armature-voltage control circuit are prepared. Said information processor When a rise [ value / of said chip temperature  $T_j$  / proper ] cannot be adjusted, at least one of said clock speed control circuits and armature-voltage control circuits is controlled. Information processing system which controls the power consumption and the cooling system which are characterized by adjusting said chip temperature  $T_j$  by performing the fall of clock frequency, and/or the fall of supply voltage.

[Claim 4] In an information processor equipped with two or more integrated circuits, the power unit which supplies power to an integrated-circuit group, and the cooling system which cools an integrated-circuit group The time delay measuring circuit which supervises / measures the time delay  $t_{pd}$  of the circuit in said information processor is prepared. Said information processor Information processing system which controls the power consumption and the cooling system which are characterized by adjusting said time delay  $t_{pd}$  by weakening cooling power of said cooling system when a time delay  $t_{pd}$  decreases from a proper value, and strengthening cooling power of said cooling system when a time delay  $t_{pd}$  increases from a proper value.

[Claim 5] It is the information processing system which controls the power consumption and the cooling system which are characterized by to adjust said time delay  $t_{pd}$  by starting an exoergic specialized circuit in the information processing system which controls power consumption and a cooling system according to claim 4, when an exoergic specialized circuit and a dummy actuation control circuit are prepared and said information processor cannot adjust reduction [ value / of said time delay  $t_{pd}$  / proper ], and starting said dummy actuation control circuit, when increase [ value / of said time delay  $t_{pd}$  / proper ] cannot be adjusted.

[Claim 6] It is the information processing system which a clock speed control circuit and an armature-voltage control circuit are prepared, said information processor controls at least one of said clock speed control circuits and armature-voltage control circuits in the information processing system which controls power consumption and a cooling system according to claim 4 or 5 when reduction of said time delay  $t_{pd}$  cannot be adjusted, and controls the power consumption and the cooling system which are characterized by adjusting said time delay  $t_{pd}$  by performing the fall of clock frequency, and/or the fall of supply voltage.

[Claim 7] In an information processor equipped with two or more integrated circuits, the power unit which supplies power to an integrated-circuit group, and the cooling system which cools an integrated-circuit group The amount control mechanism of jobs which manages the amount of jobs supplied, a clock speed control circuit, and an armature-voltage control circuit are prepared. Said information processor When the amount of jobs managed by said amount

control mechanism of jobs decreases from a proper amount, When at least one of said clock speed control circuit, an armature-voltage control circuit, and cooling systems is controlled, at least one of the fall of clock frequency, the fall of supply voltage, and the falls of cooling power is performed and the amount of jobs increases from a proper amount,